



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/597,799	08/08/2006	Ryutaro Tanaka	20289/0205086-US0	6487
7278	7590	04/16/2008		
DARBY & DARBY P.C. P.O. BOX 770 Church Street Station New York, NY 10008-0770			EXAMINER TREIDL, JESSICA I	
			ART UNIT	PAPER NUMBER
			4145	
			MAIL DATE	DELIVERY MODE
			04/16/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/597,799

Applicant(s)

TANAKA ET AL.

Examiner

JESSICA TREIDL

Art Unit

4145

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF 298)
Paper No(s)/Mail Date ____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Specification

1. The use of the trademarks/tradenames, such as EPICLON 850 and YDF-2001, has been noted in this application. They should be capitalized wherever they appear and be accompanied by the generic terminology.

Although the use of trademarks/tradenames is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks/tradenames.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, it is unclear what the unit of measurement is of the percentage referred to in the limitation "containing not less than 80 % of a tetraphenylethane derivative". For example, did applicant intend to claim weight %, volume % or mol %. Further clarification is needed.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-5, 8-12, 15-19, and 22-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Rowe et al (US 4,447,512).

Regarding claim 1, Rowe et al teach a photosensitive resin composition (Abstract, C2/L52-53) comprising a resin (A) soluble in an aqueous alkaline solution (Abstract, see aqueous alkali-sensitive substance & C4/L11-12), a crosslinking agent (B) (C4/L13-19 see organic acid reacts with epoxylated resin), a photopolymerization initiator (C) (C5/L40-45 & C5/L59-C6/L2), and a curing agent (D) (C3/L65-68 & C2/L58-C3/L19). Furthermore the reference teaches the curing agent to be 1,1,2,2-tetrakis [(2,3-epoxypropoxy)phenyl] ethane, commercially available as Epon 1031 (C3/L15-19).

The curing agent limitation (wherein the curing agent (D) is an epoxy compound obtained by glycidylating a compound containing not less than 80% of a tetraphenylethane derivative represented by recited formula (1)), is a product-by-process limitation, patentability of said limitation is based on the recited product and does not depend on its method of production. Since the product of the curing agent limitation is the same as product disclosed by Rowe et al and Rowe et al teach the product as the curing agent (thereby the curing agent comprising 100% of the

compound), the claim is unpatentable even though the Rowe et al product may have been made by a different process. In re Marosi, 710 F2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). See MPEP 2113.

Regarding claim 2, Rowe et al teach all the claim limitations as set forth above. Additionally, Rowe et al teach the composition wherein the curing agent, Epon 1031, having the recited structure, has an average epoxy equivalent of ~210 (C3/L18-19). However, as evidenced by the Hexion, Technical Data Sheet, of Epon Resin 1031, the epoxy equivalent of Epon 1031 is 195 to 230 g/equivalent. It is the examiner's position that the overlapping portion anticipates the claimed range.

Regarding claim 3, Rowe et al teach all the claim limitations as set forth above. Additionally, Rowe et al teach the composition wherein the curing agent is 1,1,2,2-tetrakis [(2,3-epoxypropoxy)phenyl] ethane, commercially available as Epon 1031 (C3/L15-19), having the recited structure. Additionally, the reference teaches the product as the curing agent, thereby the curing agent comprising 100% of the compound and more than 60 mol %.

Regarding claims 4, 11 and 18, Rowe et al teach all the claim limitations as set forth above, wherein the curing agent is 1,1,2,2-tetrakis [(2,3-epoxypropoxy)phenyl] ethane, commercially available as Epon 1031 (C3/L15-19). Additionally, Epon 1031 has a melting point of 77.2 to 82.8°C, as evidenced by Hexion MSDS Epon Resin 1031, wherein 50% of the composition is melted at 80 °C, thereby anticipating the claim.

Regarding claims 5, 12 and 19, Rowe et al teach all the claim limitations as set forth above, wherein the curing agent is 1,1,2,2-tetrakis [(2,3-epoxypropoxy)phenyl]

Art Unit: 4145

ethane, commercially available as Epon 1031 (Rowe et al C3/L15-19). The reference does not explicitly disclose the light transmittance at 400 nm of Epon 1031 in a 1 weight percent methyl ethyl ketone solution. However, it is known that Epon 1031 has strong absorbance of UV light (Hexion, Technical Data Sheet, Epon Resin 1031, P1). The light transmittance limitation is directed to a specific property of the recited material, it has been noted that once a material is disclosed to comprise the recited material, it will inherently display the recited properties. See MPEP 2112. Since Rowe et al teach the curing agent of claim 1 and the more specific embodiments of claims 2-3, Epon 1031 is known to have strong absorbance of UV light (200-400 nm), and in the absence of information to the contrary, it is the examiner's position that the curing agent of Rowe et al 1,1,2,2-tetrakis [(2,3-epoxypropoxy)phenyl] ethane, commercially available as Epon 1031 has a light transmittance at 400 nm of not less than 10 % in a 1 weight percent methyl ethyl ketone solution.

Regarding claims 8-10, 15-17 and 22-24, Rowe et al teach all the claim limitations as set forth above. Additionally, Rowe et al teach a cured product of the photosensitive resin composition, a substrate comprising a layer composed of the cured product, and an article comprising the substrate (C6/L26 the product is cured; C6/L8-26 wherein the product is on a substrate (C6/L13-17 see materials), and the substrate is part of a printing plate (C6/L19-26).

6. Claims 1-3, 5-6, 8-10, 12-13, 15-17, 19-20, and 22- 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Nojima et al (US 6,399,277).

Regarding claim 1, Nojima et al teach a photosensitive resin composition (Abstract, C4/L26) comprising a resin (A) soluble in an aqueous alkaline solution (C4/L28-29 & C3/L44-46), a crosslinking agent (B) (C4/L33 see setting adhesion – imparting agent, acts as crosslinker C14/L51), a photopolymerization initiator (C) (C4/L32), and a curing agent (D) (C4/L34 see epoxy group-containing compound). Furthermore the reference teaches the curing agent to be the commercially available product YDG-414 (C14/L20).

The curing agent limitation (wherein the curing agent (D) is an epoxy compound obtained by glycidylating a compound containing not less than 80% of a tetraphenylethane derivative represented by recited formula (1)), is a product-by-process limitation, patentability of said limitation is based on the recited product and does not depend on its method of production. Since the product of the curing agent limitation is the same as product disclosed by Nojima et al (see specification P39/¶4-P40/¶1) and Nojima et al teach the product as the curing agent (thereby the curing agent comprising 100% of the compound), the claim is unpatentable even though the Nojima et al product may have been made by a different process. In re Marosi, 710 F2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). See MPEP 2113.

Regarding claim 2, Nojima et al teach all the claim limitations as set forth above. Additionally, Nojima et al teach the composition wherein the curing agent is YDG-414, having the recited structure (see specification P39/¶4-P40/¶1). The reference does not explicitly disclose the epoxy equivalence of YDG-414, however it has an epoxy equivalence of 187g/eq as evidenced by Sagara et al (US 6,933,050 C10/L11-12).

Regarding claim 3, Nojima et al teach all the claim limitations as set forth above. Additionally, Nojima et al teach the composition wherein the curing agent is YDG-414 (C14/L20), anticipating the recited structure (see specification P39/¶4-P40/¶1). Additionally, the reference teaches the product as the curing agent, thereby the curing agent comprising 100% of the compound and more than 60 mol %.

Regarding claims 5, 12 and 19, Nojima et al teach all the claim limitations as set forth above, wherein the curing agent is YDG-414 (C14/L20). The reference does not explicitly disclose the light transmittance at 400 nm of YDG-414 of not less than 10% in a 1 weight percent methyl ethyl ketone solution, however the specification discloses YDG-414 having this limitation P39/¶4-P40/¶1.

Regarding claims 6, 13 and 20, Nojima et al teach all the claim limitations as set forth above. Additionally, Nojima et al teach the photosensitive resin composition (C4/L35 see active energy ray-setting resin & prepolymer (b-1) C4/L43-48), wherein the resin (A) soluble in the aqueous alkaline solution is a reaction product between an epoxy carboxylate compound obtained by reaction of an epoxy compound (a) having two or more epoxy groups per molecule (C4/L44 see novolak type epoxy compound, specifically C10/L15-46) with a monocarboxylic acid (b) having an ethylenic unsaturated group per molecule (C4/L45-46 see α,β -unsaturated carboxylic acid), and a polybasic acid anhydride (c) (C4/L48 see polybasic acid anhydride).

Regarding claims 8-10, 15-17 and 22-24, Nojima et al teach all the claim limitations as set forth above. Additionally, Nojima et al teach a cured product of the photosensitive resin composition, a substrate comprising a layer composed of the

Art Unit: 4145

cured product, and an article comprising the substrate (C27/L53-65, wherein the resin is cured with UV light C27/L60, the substrate is the patterned copper-clad laminate board C27/L56 and the article is the solder resist C27/L53).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1-5, 7-12, 14-19 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al WO/2002/094904 (see NPL English translation) in view of Rowe et al (US 4,447,512).

Regarding claim 1, Tanaka et al teach a photosensitive resin composition comprising a resin (A) soluble in an aqueous alkaline solution, a crosslinking agent (B), a photopolymerization initiator (C), and a curing agent (D) (P10/¶5). Furthermore the reference teaches the curing agent to be an epoxy compound (P28/¶2) containing phenol groups (P29/¶2 see phenol novolak, naphthalene, and trihydroxyphenylmethane). The reference does not teach the curing agent (D), wherein the curing agent (D) is an epoxy compound obtained by glycidylating a compound containing not less than 80% of a tetraphenylethane derivative represented by recited formula (1).

Rowe et al disclose a photosensitive resin composition (Abstract, C2/L52-53) comprising a resin (A) soluble in an aqueous alkaline solution (Abstract, see aqueous alkali-sensitive substance & C4/L11-12), a crosslinking agent (B) (C4/L13-19 see organic acid reacts with epoxylated resin), a photopolymerization initiator (C) (C5/L40-45 & C5/L59-C6/L2), and a curing agent (D) (C3/L65-68 & C2/L58-C3/L19). Furthermore the reference teaches the curing agent to be 1,1,2,2-tetrakis [(2,3-epoxypropyl)phenyl] ethane, commercially available as Epon 1031 (C3/L15-19).

Finally, the reference teaches the composition, containing an O-epoxyalkylate tetrakis (hydroxyl phenyl) alkane resin such as 1,1,2,2-tetrakis [(2,3-epoxypropyl)phenyl], to have a long pot life (C2/L52-66).

Tanaka et al and Rowe et al disclose analogous photosensitive resin compositions containing aqueous alkaline solutions and epoxy curing agents. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the curing agent of Rowe et al, 1,1,2,2-tetrakis [(2,3-epoxypropyl)phenyl] ethane, commercially available as Epon 1031, in place of the epoxy curing agent of Tanaka et al to increase the pot life of the composition.

The curing agent limitation (wherein the curing agent (D) is an epoxy compound obtained by glycidylating a compound containing not less than 80% of a tetraphenylethane derivative represented by recited formula (1)), is a product-by-process limitation, patentability of said limitation is based on the recited product and does not depend on its method of production. Since the product of the curing agent limitation is the same as product disclosed by Rowe et al and Rowe et al teach the product as the curing agent (thereby the curing agent comprising 100% of the compound), the claim is unpatentable even though the Rowe et al product may have been made by a different process. In re Marosi, 710 F2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). See MPEP 2113.

Regarding claim 2, modified Tanaka et al teach all the claim limitations as set forth above. Additionally, Rowe et al teach the composition wherein the curing agent, Epon 1031, having the recited structure, has an average epoxy equivalent of 210.240

(C3/L18-19). However, as evidenced by the Hexion, Technical Data Sheet, of Epon Resin 1031, the epoxy equivalent of Epon 1031 is 195 to 230 g/equivalent. It is the examiner's position that the overlapping portion anticipates the claimed range.

Regarding claim 3, modified Tanaka et al teach all the claim limitations as set forth above. Additionally, Rowe et al teach the composition wherein the curing agent is 1,1,2,2-tetrakis [(2,3-epoxypropoxy)phenyl] ethane, commercially available as Epon 1031 (C3/L15-19), anticipating the recited structure. Additionally, Rowe et al teach the product as the curing agent, thereby the curing agent comprising 100% of the compound and more than 60 mol %.

Regarding claims 4, 11 and 18, modified Tanaka et al teach all the claim limitations as set forth above, wherein the curing agent is 1,1,2,2-tetrakis [(2,3-epoxypropoxy)phenyl] ethane, commercially available as Epon 1031 (Rowe et al C3/L15-19). Additionally, Epon 1031 has a melting point of 77.2 to 82.8°C, as evidenced by Hexion MSDS Epon Resin 1031, wherein 50% of the composition is melted at 80 °C, thereby anticipating the claim.

Regarding claims 5, 12 and 19, modified Tanaka et al teach all the claim limitations as set forth above, wherein the curing agent is 1,1,2,2-tetrakis [(2,3-epoxypropoxy)phenyl] ethane, commercially available as Epon 1031 (Rowe et al C3/L15-19). The reference does not explicitly disclose the light transmittance at 400 nm of Epon 1031 in a 1 weight percent methyl ethyl ketone solution. However, it is known that Epon 1031 has strong absorbance of UV light (Hexion, Technical Data Sheet, Epon Resin 1031, P1). The light transmittance limitation is directed to a specific property of

the recited material, it has been noted that once a material is disclosed to comprise the recited material, it will inherently display the recited properties. See MPEP 2112. Since the modified teachings of the Tanaka et al teach the curing agent of claim 1 and the more specific embodiments of claims 2-3, it is known to have strong absorbance of UV light (200-400 nm), and in the absence of information to the contrary, it is the examiner's position that the curing agent of modified Tanaka et al 1,1,2,2-tetrakis [(2,3-epoxypropoxy)phenyl] ethane, commercially available as Epon 1031 has a light transmittance at 400 nm of not less than 10 % in a 1 weight percent methyl ethyl ketone solution.

Regarding claims 7, 14, and 21, modified Tanaka et al teach all the claim limitations as set forth above. Additionally, Tanaka et al teach the photosensitive resin composition, wherein the resin (A) soluble in the aqueous alkaline solution is a reaction product between an epoxy carboxylate compound obtained by reaction of an epoxy compound (d) having two epoxy groups per molecule with a monocarboxylic acid (b) having an ethylenic unsaturated group per molecule, a diisocyanate compound (e), a carboxylic acid (f) having two hydroxyl groups per molecule, and, as an optional component, a diol compound (g) (P5, entire page).

Regarding claims 8-10, 15-17 and 22-24, modified Tanaka et al teach all the claim limitations as set forth above. Additionally, Tanaka et al teach a cured product of the photosensitive resin composition, a substrate comprising a layer composed of the cured product, and an article comprising the substrate (P10/¶6-P11/¶2).

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSICA TREIDL whose telephone number is (571)270-3993. The examiner can normally be reached on Monday- Thursday, 7:30AM- 5PM EST, Alt. Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on (571) 272-1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J.T./
/4.11.08/

/Basia Ridley/
Supervisory Patent Examiner, Art Unit 4145